

REMARKS

In the present application, claims 1-13 and 15-40 are pending. Claims 1-13 and 15-40 are rejected. As a result of this response, claims 1-13 and 15-40 are believed to be in condition for allowance.

Claim Rejections - 35 USC § 103

The Examiner rejected claims 1-3, 5, 6, 15- 32, and 34-40 as being unpatentable over Miyamoto et al. (5,114,224) in view of Raskar (US 6,793,350) and Connelly et al. (2003/0202156).

The Examiner states that Miyamoto teaches “At least one mount (10) for mounting a projection unit, the unit comprised of at least a projector (11) for projecting a distorted image (since it is designed for projecting on a curved surface it must project at least a slightly distorted image since a non-distorted flat image would not appear correct on a curved surface (see column 1 line 60 through column 2 line 9 of Raskar et al. (US 6,793,350) which teaches that even for large curved displays (such as that taught by Miyamoto) that a pre-distorted image is necessary to allow a viewer to view an undistorted image and the rest of Raskar teaches a preferred method of achieving an undistorted image in various environments such as that taught by Miyamoto and accordingly it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use such a method in the projection/positioning system of Miyamoto so that an undistorted image is viewable by a viewer at an [sic] position); wherein the at least one mount is coupled to a mechanism for providing rotational movement for adjusting one of a position and an orientation of the projection unit to produce from the distorted image a substantially undistorted image on a surface (as stated above with regards to Raskar it is obvious that a undistorted image would be produced, in general people do not purposely make highly distorted images when advertising which is what Miyamoto is designed for.)”

Applicants respectfully disagree with the Examiner’s assertions. As discussed more fully below, the Examiner is incorrect when characterizing the teachings of Miyamoto, when characterizing the teachings of Raskar, and when asserting a motivation to combine the teachings of Miyamoto with those of Raskar.

Claim 1 recites:

1. A positioning system comprising,
at least one mount for mounting a projection unit, the projection unit comprised of
at least a projector **for projecting a distorted image**; wherein the at least
one mount is coupled to a mechanism for providing translational
movement and rotational movement for adjusting one of a position and an
orientation of the projection unit **to produce from the distorted image a
substantially undistorted image on a surface.** (emphasis added)

For purposes of discussion, each of the Examiner's assertions repeated above is considered in turn as follows:

Examiner's assertion: "Miyamoto teaches ... a projector (11) for projecting a distorted image (since it is designed for projecting on a curved surface it must project at least a slightly distorted image since a non-distorted flat image would not appear correct on a curved surface)".

Applicants' response: The Examiner makes two contradictory assertions. The first assertion is that Miyamoto teaches "projecting a distorted image". The second assertion is that it "would have been obvious to one of ordinary skill in the art at the time of the invention was made to use such a method [that of Raskar] in the projection/positioning system of Miyamoto". The Examiner is therefore asserting that Miyamoto both teaches this element and that, while Miyamoto fails to teach this element, it would be obvious to make use of the teachings of Raskar wherein is taught this element.

As has been stated by Applicants numerous times in the past, Miyamoto nowhere makes any mention or suggestion of any ability to distort the image that is projected. It is of note that the Examiner is unable to cite a single, solitary instance of any teaching of Miyamoto that is in any way indicative or suggestive of any form of distortion applied to the projected image. Rather, the Examiner once again asserts that Miyamoto simply "**must** project at least a slightly distorted image since a non-distorted flat image would

not appear correct on a curved surface”. (emphasis added). Applicants respectfully disagree. Applicants do note the existence of the doctrine of anticipation “by inherency”. It has been held that “Under the principles of inherency, if the prior art necessarily functions in accordance with, or includes, the claimed limitations, it anticipates.” *Abbott Laboratories v. Geneva Pharmaceuticals, Inc.*, 182 F.3d 1315, 51 USPQ2d 1307 (Fed. Cir. 1999). However, as discussed immediately below, this doctrine is inapplicable in the present case as the cited art need not function in accordance with the claimed limitations.

As noted above, Applicants disagree with the Examiner’s assertion that a non-distorted image would not appear “correct on a curved surface”. As discussed in detail in response to the previous Office Action, there is nothing to indicate that the projected image of Miyamoto et al. would appear to be not “correct” despite the inevitable small amount of distortion introduced when projected on “an airship or a balloon” as recited in the Abstract. It is worth noting that airships that advertise over sporting events typically display text and images formed from light emitting elements positioned in a rectangular array along the gently curving exterior of the craft. Despite the curve of the craft, the text elements are formed as bounded by a rectangular grid. While the curvature of the craft may induce some distortion, great volumes of text and innumerable images, such as the much beloved Snoopy, have been, and continue to be, displayed in such a format all the while appearing “correct”. Applicants therefore respectfully submit that the Examiner is in error when asserting that one **must** do what one simply **need not** do.

Examiner’s assertion: “see column 1 line 60 through column 2 line 9 of Raskar et al. (US 6,793,350) which teaches that even for large curved displays (such as that taught by Miyamoto) that a pre-distorted image is necessary to allow a viewer to view an undistorted image and the rest of Raskar teaches a preferred method of achieving an undistorted image in various environments such as that taught by Miyamoto”

Applicants’ response: The Examiner’s assertion is not entirely congruent with the teachings of Raskar. Raskar, at col. 1, line 60-col. 2, line 9 makes a very straightforward observation about the physical reality of projecting images. Raskar notes that, when an image is projected onto a curved screen, the image appears correct from only a single spot in space known as the sweet spot. Raskar continues that “As the

viewer moves away from the sweet-spot, the images appear distorted.” Unfortunately, the ability for a viewer to view the image from the sweet-spot is negated by the necessity that the projector be at the sweet-spot. As Raskar notes “in real-world applications, viewers like to be at the exact same place where the projectors ideally need to be located.” The rest of Raskar is devoted to teaching a methodology whereby warped images can be projected onto curved surfaces so as to allow one to move the projector from the sweet-spot thus allowing a viewer to inhabit the sweet-spot. As Raskar concludes at col. 11, lines 33-37, “An advantage is that, unlike prior art systems, our projectors do not need to be placed at the sweet-spot. This is important in real-world applications where the sweet spot is usually exactly where viewers would like to be.”

The Examiner fails to note Raskar makes explicitly clear that distortion is only required when the projector is moved from the sweet-spot and that only a single viewer, viewing the image from the exact location as the sweet-spot will see no distortion in the image. As noted above, Raskar plainly states that deviations in viewing positions away from the sweet-spot introduce distortion. This is always true and Raskar makes no attempt at rectifying this reality nor does Raskar teach any desire or ability to mitigate this fact.

Examiner’s assertion: “... it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use such a method in the projection/positioning system of Miyamoto so that an undistorted image is viewable by a viewer at an [sic] position)”.

Applicants’ response: As applicant has repeatedly stated, there exists no motivation to combine the references of Miyamoto et al. and Raskar, and such a combination is neither suggested herein nor deemed appropriate.

Reviewing, Miyamoto et al. is directed, generally, to automatically tracking the position of a moving light emitting member mounted on an object in order to project an image on the object. As discussed above, there is simply no mention or suggestion of any motivation to distort the projected image. Raskar is directed, in general, to generating a distorted image for projection upon a curved surface to allow one to move the image projector away from the sweet-spot and allow a viewer to inhabit the sweet-spot. As, in all disclosed embodiments, the curved display surface and projector of

Raskar are stationary with respect to each other, there is disclosed not a scintilla of motivation to combine the teachings of Raskar with any teaching directed to tracking and projecting upon a moving object.

For the myriad reasons stated above, claim 1 is in condition for allowance. Specifically, there exists no motivation to combine the teachings of Miyamoto et al. and Rasker. Absent such an improper combination, neither Miyamoto et al. taken singularly or in combination with Connelly et al., such a combination neither suggested nor deemed proper, teach the recited elements of claim 1. As all of claims 2-13 and 15-23 depend upon claim 1, they are likewise in condition for allowance. Claim 24 similarly recites “a projector for projecting a distorted image” and is, for the reasons discussed above, in condition for allowance. As claims 25-29 depend on claim 24, they are likewise in condition for allowance.

Although, as noted above, claim 18 is in condition for allowance, Applicants respectfully argue that the Examiner is incorrect in asserting that “As described in column 4 of Miyamoto, geometric information is used in determining the projection position. (Cartesian coordinates are a type of geometric information)”. While taking no stand on the Examiner’s classification of “Cartesian coordinates” as “a type of geometric information”, Applicants note that claim 18 recites the positioning controller comprising “a source of geometric **model** information.” At the recited citation, Miyamoto discloses deriving x and y coordinates for use in tracking the IR emitter. As a result, the cartesian coordinates of Miyamoto et al. are not equivalent to geometric **model** information. Therefore, Miyamoto does not disclose the use of geometric **model** information. For this reason alone, claim 18 is in condition for allowance.

With respect to claim 32, the Examiner asserts that “using the projector to make an undistorted image upon a surface is obvious in light of the projector that does so.” For the reasons discussed above, it is again asserted that neither Miyamoto et al. nor Connelly teach the asserted element. Claim 32 is therefore in condition for allowance.

With regards to claims 30 and 31, the Examiner asserts that “it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Raskar’s method of projecting with multiple projectors/cameras on large curved surfaces in the method of projecting taught by Miyamoto alone or in view of Connelly. As

discussed in detail above, neither Miyamoto nor Connelly recite or otherwise provide any motivation for combining their teachings with a reference directed to projecting a distorted image as is Raskar. Absent such a combination, such a combination deemed inappropriate, no singularly recited piece of art recites both “providing both translational movement and rotational movement of the at least one projector” and “projecting a distorted image” as recited in claim 30. Claim 30 is therefore in condition for allowance.

With specific reference to claim 31, there is recited both “moving the at least one projector to a location to project the calibration image upon a target surface” and “repeating the ... moving ... for a plurality of positions of the at least one projector.” Of the Examiner’s recited references, only Raskar makes note of any calibration. However, Raskar makes clear at col. 4, lines 59-61, “For each projector *i*, a predetermined image 101, e.g., a structured pattern in the form of a checkerboard, is projected 110 onto the quadratic surface.” Raskar does not teach moving a projector, but rather teaches a plurality of cameras moved to different locations at which calibration is performed. For this reason alone, claim 31 is therefore in condition for allowance.

The Examiner’s entire analysis of claim 34 consists of the observation/assertion, “Part 4 is basically a computer that executes a computer program for positioning a projection unit to provide a substantially undistorted image upon a surface.” It is assumed that the Examiner’s reference to “Part 4” is a reference to the driving section 4 of Miyamoto. However, there is no teaching in Miyamoto that such positioning comprises “referring to a stored geometric model for the location to produce the substantially undistorted image in accordance with the geometric model” as recited.” Connelly likewise lacks any such teaching. In addition, assuming, arguendo, that Raskar teaches such a use of a geometric model, Raskar does not teach “positioning a projection unit” as instructed by a program as recited. Therefore, neither Raskar nor Miyamoto nor Connelly individually teach the elements of claim 34. As noted above, there exists no motivation to combine these teachings, such a combination neither suggested nor deemed proper. Claim 34 is therefore in condition for allowance.

Claims 35 and 37 both recite projecting a distorted image. For the reasons discussed above, claims 35 and 37 are in condition for allowance. As claims 36 and 38-39 depend upon claims 35 and 37, they are likewise in condition for allowance.

Lastly, claim 40 recites “a controller coupled to a positioning apparatus for positioning a projection unit” and “the controller being responsive to stored geometric model”. As noted above, only Miyamoto and Connelly offer any suggestion of positioning a projection unit. In neither teaching, however, is there suggested a geometric model. While Raskar makes mention of a geometric model, there is no teaching of a positioning apparatus coupled to a controller. Also as noted above, there is provided no motivation to combine the teachings of Miyamoto, Raskar, and Connelly, such a combination neither suggested nor deemed appropriate. Therefore, none of the recited art singularly teaches the recited elements of claim 40 and the combination of the recited art is improper. For the reasons stated above, claim 40 is in condition for allowance.

The Examiner additionally rejected claim 4 as being unpatentable over Miyamoto et al. in view of Connelly et al. as applied to claims 1-3, 5, 6, 15-29, 32, and 34-40 above, and further in view of Machtig (5,278,596). However, as claim 4 is dependent upon claim 1, and as Machtig does not teach or disclose projecting a distorted image and producing from the distorted image a substantially undistorted image on a surface, claim 4 is in condition for allowance for the reasons recited above.

The Examiner rejected claims 7-13 and 33 as being unpatentable over Miyamoto et al. in view of Connelly et al. as applied to claims 1-3, 5, 6, 15-29, 32, and 34-40 above, and further in view of Pinhanez (6,431,711). The Examiner notes that Miyamoto et al. and Connelly “do not teach that the system is used for user interaction” while asserting that “Pinhanez’s system further includes an interactivity portion allowing interaction between people and a projector.” For the reasons discussed above, claim 1 is in condition for allowance. As all of claims 7-13 depend upon claim 1, claims 7-13 are in condition for allowance.

Claim 33 recites, in part, “positioning the interaction recognition system at a location by referring to the area layout information”. Neither Miyamoto et al. nor Connelly make any reference to an interaction recognition system. Pinhanez recites the use of a camera to provide interactive capability. (col. 12, line 56 – col. 13, line 46). However, there is no teaching or suggestion of positioning the camera in response to any area layout information as is claimed. As a result claim 33 is in condition for allowance.

Response to Arguments

The Examiner notes that “In the non-final rejection of 7/14/2005 as stated in applicant’s arguments the issue of projecting a distorted image was addressed through official notice with the Raskar reference serving of [sic] evidence of that official notice, however since applicant challenges this official notice, the Raskar reference has been further explained and added to the rejection (see Zurko 59 USPQ2d at 1697). Since this has only been added to support an assertion of well known obviousness the rejection is made final”.

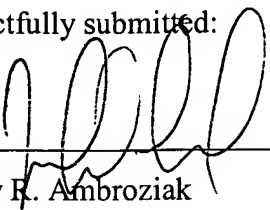
Applicants note that, in the non-final rejection of 7/14/2005, the Examiner nowhere noted that the Raskar reference was intended to serve as evidence of official notice as is now asserted. The prior assertion to which the Examiner refers reads: “since it is designed for projecting on a curved surface it must project at least a slightly distorted image since a non-distorted flat image would not appear correct on a curved surface (see Raskar et al. (US 6,793,350))”. As is evident, the Examiner’s past and present assertions regarding this issue have not only been added “to support an assertion of well known obviousness”. As argued in the previous response and herein, the Examiner’s assertion of official notice is not factually correct. Assuming, *arguendo*, that the disclosure of Raskar supported the Examiner’s assertion of official notice (which it does not), the assertion itself is false and, hence, is not of well known obviousness. Further explanation of the Raskar reference by the Examiner does not cure this defect. For this reason alone, it was improper to make the pending office action final. Revocation of the finality is respectfully requested.

An earnest and thorough attempt has been made by the undersigned to resolve the outstanding issues in this case and place same in condition for allowance. If the Examiner has any questions or feels that a telephone or personal interview would be helpful in resolving any outstanding issues which remain in this application after consideration of this amendment, the Examiner is courteously invited to telephone the undersigned and the same would be gratefully appreciated.

It is submitted that the claims herein patentably define over the art relied on by the Examiner and early allowance of same is courteously solicited.

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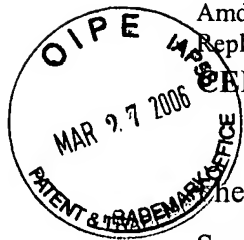
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